The Lost Landscape: A story of deposition and erosion in the ExoMars rover landing site

Other

the lost landscape:

A STORY OF DEPOSITION AND EROSION

in the ExoMars rover landing site

a poster by Joe McNeil | The Open University

In summer 2023, after a **nine month**, **400 million km journey**, the **ExoMars rover '*Rosalind Franklin*'** will reach its final destination: **Oxia Planum, Mars.**

Oxia Planum is a **four billion-year-old** clay-bearing plain located at the northwestern extreme of Mars' ancient **southern hemisphere**.

Chosen for its **geological diversity**, abundance of **hydrated minerals**, and **gentle topography**, **Oxia Planum** is an ideal landing site for *Rosalind Franklin*, which will:

1. explore the subsurface geochemistry

2. investigate the geology at the surface

3. search for evidence of ancient life

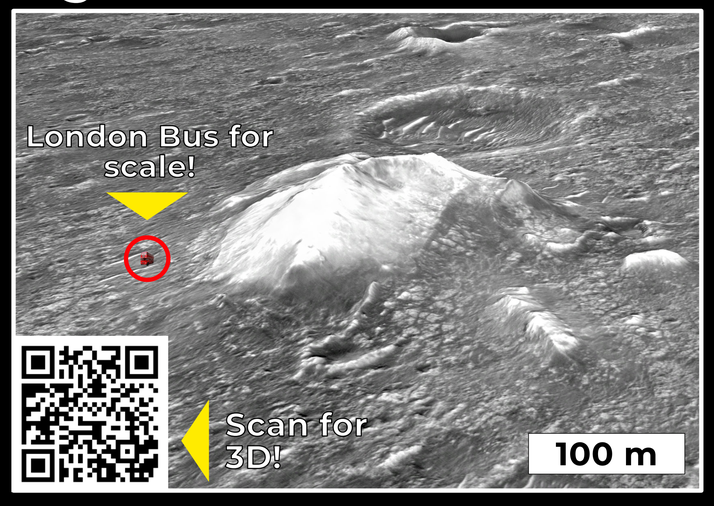
In order to place the **rover observations** into a **regional context**, we must have an **understanding** of Oxia Planum's geology **before *Rosalind Franklin* arrives on Mars**.

To do this, geologists must **investigate the features** of Oxia Planum using **high-resolution satellite images** captured by spacecraft in orbit around the red planet.

MY PROJECT: MOUNDS IN OXIA PLANUM

Some of the most striking features of the Oxia Planum region are thousands of **isolated kilometre-scale hills and mounds** that rise above the clay-bearing plains (Fig. 1, 2).

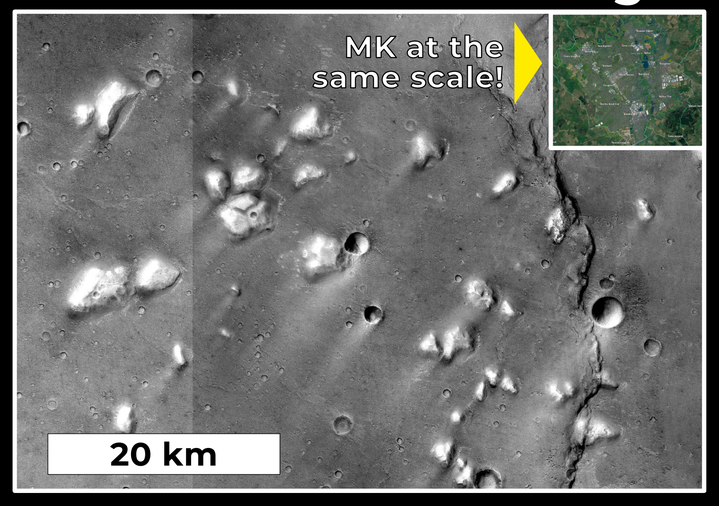
Fig. 1



they can be a few hundred metres wide...

or several kilometres!

Fig. 2

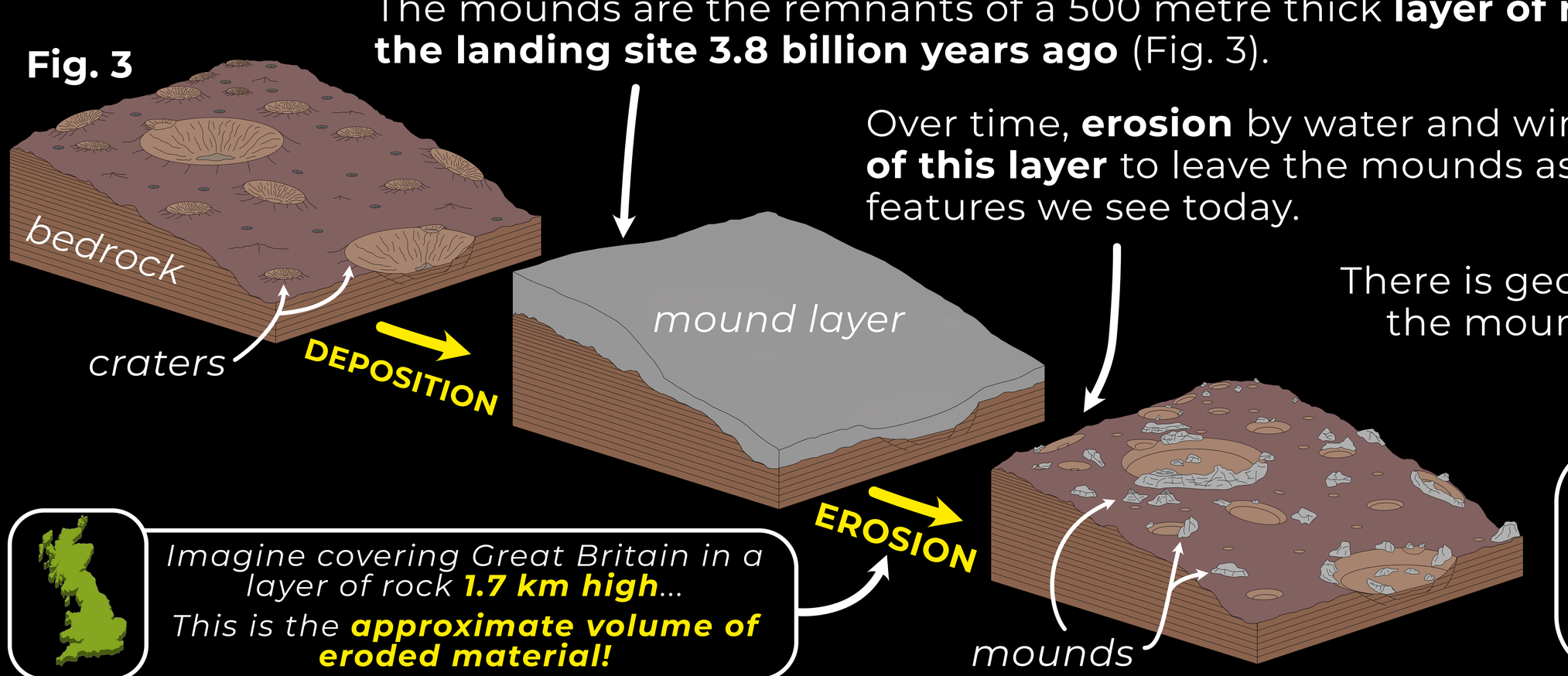


But... we don't know **what they are**, **how old they are**, or **why they are so abundant!**

So, I identified **>14,000 mounds**, calculated their **heights**, and made observations of their **geology**.

The mounds are the remnants of a 500 metre thick **layer of rock** that **covered the landing site 3.8 billion years ago** (Fig. 3).

Fig. 3



Over time, **erosion** by water and wind **removed most of this layer** to leave the mounds as the upstanding features we see today.

There is geologic evidence that the mounds **interacted with water** in the past...

*so they could be **important astrobiological targets** for the rover to explore!*

*Imagine covering Great Britain in a layer of rock **1.7 km high**...*

*This is the **approximate volume of eroded material!***

Scan for publication with plain language summary!

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